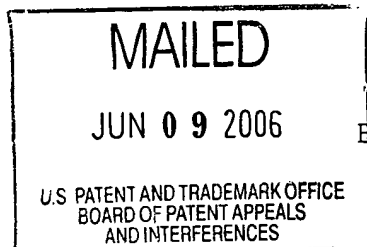


The opinion in support of the decision being entered today was not written for publication in a law journal and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE



BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte FERNANDO C. VIDAURRI, JR., JEFFREY S. FODER,  
and JON F. GEIBEL

Appeal No. 2006-1660  
Application No. 10/609,087

ON BRIEF

Before KIMLIN, TIMM, and JEFFREY T. SMITH, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1, 35-50 and 60-72. Claim 1 is illustrative:

1. A method for preparing polyphenylene sulfide polymer, comprising:

reacting an aqueous metal hydroxide with a polar organic compound within a metal vessel comprising iron, chromium and nickel and within a temperature range to form a solution having a reaction product of the metal hydroxide and the polar organic compound;

dehydrating the solution such that at least a portion of the water is removed from the solution without isolating a solid from the solution;

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contacting a sulfur source with the solution to form a mixture;

dehydrating the mixture at a temperature greater than 100°C such that at least a portion of the water is removed from the mixture; and

contacting at least a dihaloaromatic compound, with the mixture under polymerization conditions to form polyphenylene sulfide polymers, wherein the corrosiveness of at least one of the solution or the mixture to the metal vessel is such that the polyphenylene sulfide polymers comprise less than 55 ppm iron, less than 15 ppm chromium, or less than 15 ppm nickel, or any combination thereof.

The examiner relies upon the following references in the rejection of the appealed claims:

Campbell	3,867,356	Feb. 18, 1975
Senga	5,093,469	Mar. 3, 1992
Koyama et al. (Koyama)	5,856,433	Jan. 5, 1999

Appellants' claimed invention is directed to a method for preparing a polyphenylene sulfide (PPS) polymer comprising forming a reaction product of an aqueous metal hydroxide, such as sodium hydroxide, with a polar organic compound, such as N-methyl-2-pyrrolidone (NMP), and dehydrating the reaction solution without isolating the solid reaction product, an alkali metal aminoalkanoate, from the solution. A sulfur source is then contacted with the solution to form a mixture which is dehydrated before contacting the mixture with a dihaloaromatic compound under conditions to form the PPS polymer.

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Appealed claims 68 and 71 stand rejected under 35 U.S.C. § 112, first paragraph, description requirement. The appealed claims also stand rejected under prior art as follows:

(a) claims 42-50, 70 and 72 under 35 U.S.C. § 102(b) or, in the alternative, under 35 U.S.C. § 103(a) over Senga;

(b) claims 1, 35-50, 60-67, 69, 70 and 72 under 35 U.S.C. § 103(a) as being unpatentable over Senga in view of Koyama;

(c) claims 42-50 and 70-72 under 35 U.S.C. § 102(b) or, in the alternative, under 35 U.S.C. § 103(a) over Campbell; and

(d) claims 1, 35-50 and 60-72 under 35 U.S.C. § 103(a) as being unpatentable over Campbell in view of Koyama.

We have thoroughly reviewed the respective positions advanced by appellants and the examiner. In so doing, we agree with appellants that the examiner's § 112, first paragraph rejection is not sustainable. However, we are in complete agreement with the examiner that the claimed subject matter is unpatentable over the cited prior art for essentially those reasons expressed by the examiner. Our reasoning follows:

We consider first the examiner's rejection under § 112, first paragraph. It is the examiner's position that the original specification does not provide descriptive support for the exclusion of lithium halide, as recited in claims 68 and 71.

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However, we fully concur with appellants that the original specification reasonably conveys to one of ordinary skill in the art that appellants had possession of the concept that the claimed process can be performed without the use of lithium halide. Indeed, appellants' specification exemplifies processes within the scope of the appealed claims that do not employ a lithium halide. Accordingly, the examiner's § 112, first paragraph rejection is reversed.

We will sustain the examiner's rejection of claims 42-50, 70 and 72 over Senga to the extent it is based on § 103. There is no dispute that Senga, like appellants, discloses a process for preparing PPS polymers by reacting an aqueous metal hydroxide and a polar organic compound to form an alkali metal aminoalkanoate which, in turn, is reacted with a sulfur source and a dihaloaromatic compound to form the PPS polymer. While we agree with appellants that Senga does not provide a clear description of not isolating the aminoalkanoate from solution for purposes of § 102, we are convinced that it would have been obvious for one of ordinary skill in the art to forego the time and cost of the isolation step before reacting the aminoalkanoate with a sulfur source and dihaloaromatic compound to form the PPS polymer. As pointed out by the examiner, Senga

expressly teaches that "the components including the dihalogen aromatic compound, the sodium hydrosulfide, the alkali metal aminoalkanoate, and the lithium halide may be added or contacted in any order to or in the organic polar solvent as long as they can be polymerized in the organic polar solvent" (column 6, lines 8-13). Hence, we are satisfied that one of ordinary skill in the art would not have found it necessary to remove the intermediate product aminoalkanoate from the organic polar solvent, i.e., appellants' polar organic compound (NMP). While appellants stress that Senga's employment of the solvent NMP "in *both* the process of producing alkali metal aminoalkanoate and in the subsequent polymerization process does not indicate that the alkali metal aminoalkanoate would remain in solution as a feedstock of the polymerization process" (sentence bridging pages 12 and 13 of principal brief), appellants' claims do not require that the aminoalkanoate remain in solution, i.e., the claims specify that the aminoalkanoate solid is not isolated from the solution. Moreover, we find that Senga's use of the same solvent in both processes is evidence of the obviousness of not isolating the aminoalkanoate.

As for the recitations in claims 50 and 72 regarding the low contamination levels of iron, chromium and nickel in the PPS

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polymer, we fully concur with the examiner that it is reasonable to conclude that the process of Senga, which uses the same components, also has the same contamination levels. The obviousness of such low levels of contaminants is further supported by the examiner's citation of Koyama, who evidences the use of corrosion-resistant stainless steel alloys for reaction vessels. Appellants have not advanced any compelling rationale, let alone objective evidence, which demonstrates that processes fairly taught by Senga would have contamination levels for the polymer product outside the claimed ranges. Also, appellants' argument that Senga does not incorporate the corrosive sodium hydroxide in the polymerization process lends further support to the reasonable conclusion regarding the contaminant level in Senga's polymer product. If it is appellants' position that their failure to isolate the aminoalkanoate from the solution which contains sodium hydroxide presents a contamination problem for the polymer product, we find that it would have been a matter of obviousness for one of ordinary skill in the art to perform a cost/benefit analysis pertaining to isolating the aminoalkanoate from the caustic solution.

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We now turn to the examiner's § 102/§ 103 rejection of claims 42-50 and 70-72 over Campbell. Campbell, like appellants and Senga, discloses a process for forming PPS polymers utilizing the same reaction scheme. However, while Campbell exemplifies isolating the aminoalkanoate intermediate, we find that the reference also provides a description of the claimed process within the meaning of § 102. As noted by the examiner, Campbell expressly discloses that the solution of alkali metal aminoalkanoate, NMP, and alkali metal hydroxide "is a particularly useful solution which can be used for many chemical conversions such as, for example, in the preparation of arylene sulfide polymers such as poly(p-phenylene sulfide) from alkali metal bisulfides such as sodium bisulfide and polyhalo-substituted aromatic compounds such as 1,4-dichlorobenzene" (column 5, lines 31-37). Moreover, based on the entirety of the Campbell disclosure, we are convinced that it would have been obvious for one of ordinary skill in the art to prepare the PPS polymers without isolating the aminoalkanoate intermediate, as presently claimed. Regarding appellants' argument that Campbell does not teach the claimed pressure range from atmospheric pressure to about 30 psig during the second dehydration step of claim 49, we find no error in the examiner's reasoning that

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Campbell's disclosure of atmospheric pressure for the first dehydration step would have rendered obvious performing a second dehydration step under substantially the same pressure, in the absence of disclosure to the contrary. Furthermore, it is well settled that where patentability is predicated upon a change in a condition of a prior art composition or a process, such as a change in concentration, temperature, pressure or the like, the burden is on the applicant to establish with objective evidence that the change is critical, i.e., it leads to a new, unexpected result. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). In the present case, appellants have proffered no such evidence. Appellants' pointing to the elevated pressures during Campbell's polymerization step is irrelevant to the pressure used for the second dehydration step prior to polymerization.

Concerning the contaminant levels of claims 50 and 72, for the reasons set forth above with respect to the rejection over Senga, we find that it is reasonable to conclude that the polymer product of Campbell has similar low contamination levels, particularly in light of the obviousness of employing the stainless steel reaction vessels of Koyama.




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As a final point, we note that appellants base no argument upon objective evidence of nonobviousness, such as unexpected results, pertaining to the claimed elimination of the isolation step or the process parameters of pressure, temperature, etc. Accordingly, the prima facie case of obviousness established by the examiner stands unrebutted.


In conclusion, based on the foregoing, the examiner's decision rejecting the appealed claims is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv) (effective Sep. 13, 2004; 69 Fed. Reg. 49960 (Aug. 12, 2004); 1286 Off. Gaz. Pat. Office 21 (Sep. 7, 2004)).

AFFIRMED

  
EDWARD C. KIMLIN )  
Administrative Patent Judge )

  
CATHERINE TIMM )  
Administrative Patent Judge )

  
JEFFREY T. SMITH )  
Administrative Patent Judge )

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